1/18

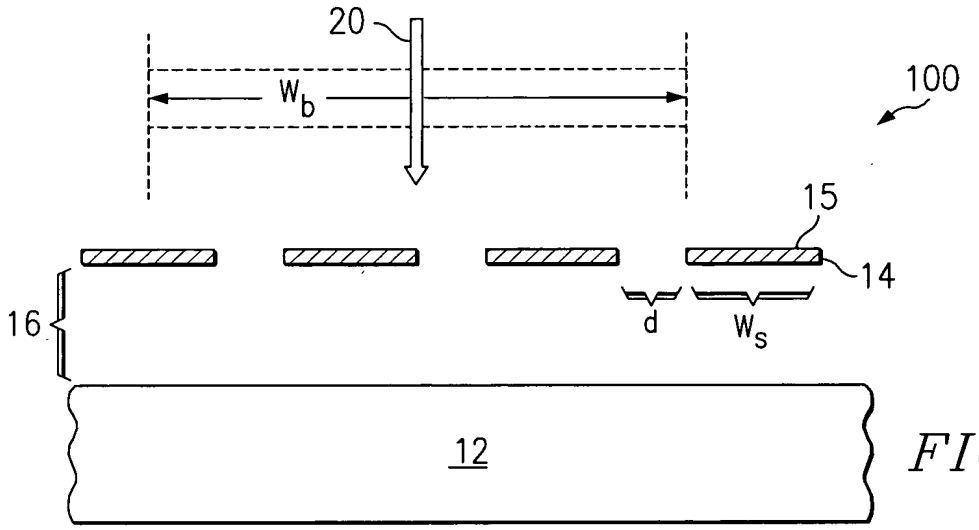


FIG. 1a

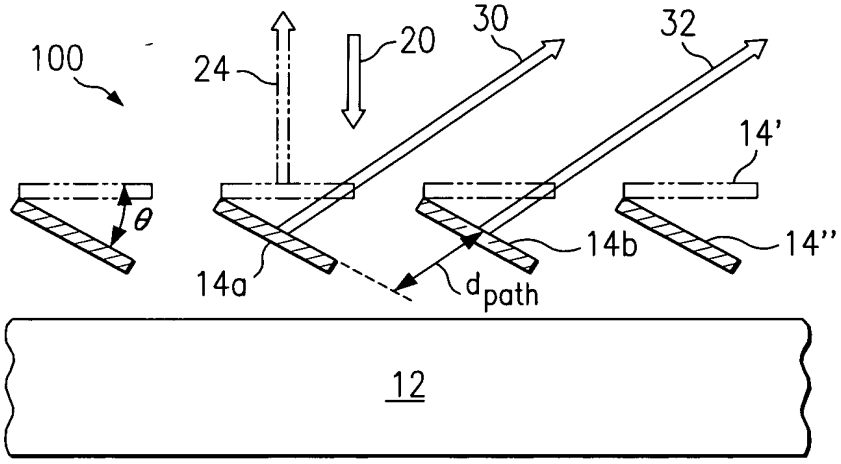


FIG. 1b

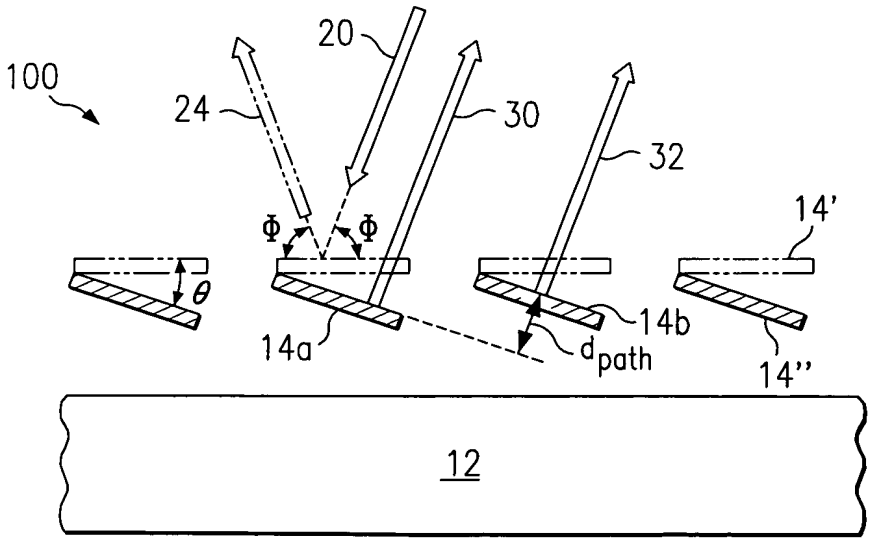
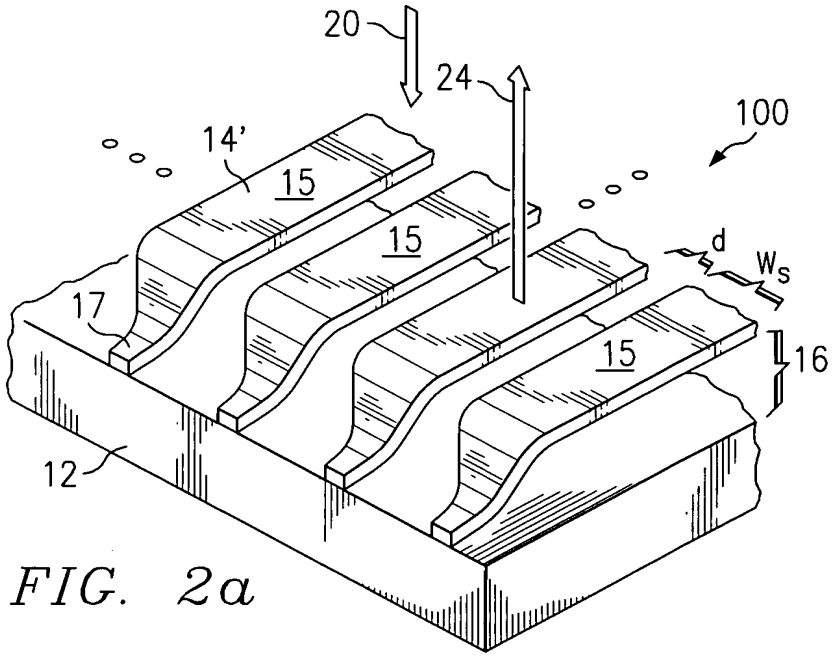


FIG. 1c


20
24
100
14'
15
15
15
d
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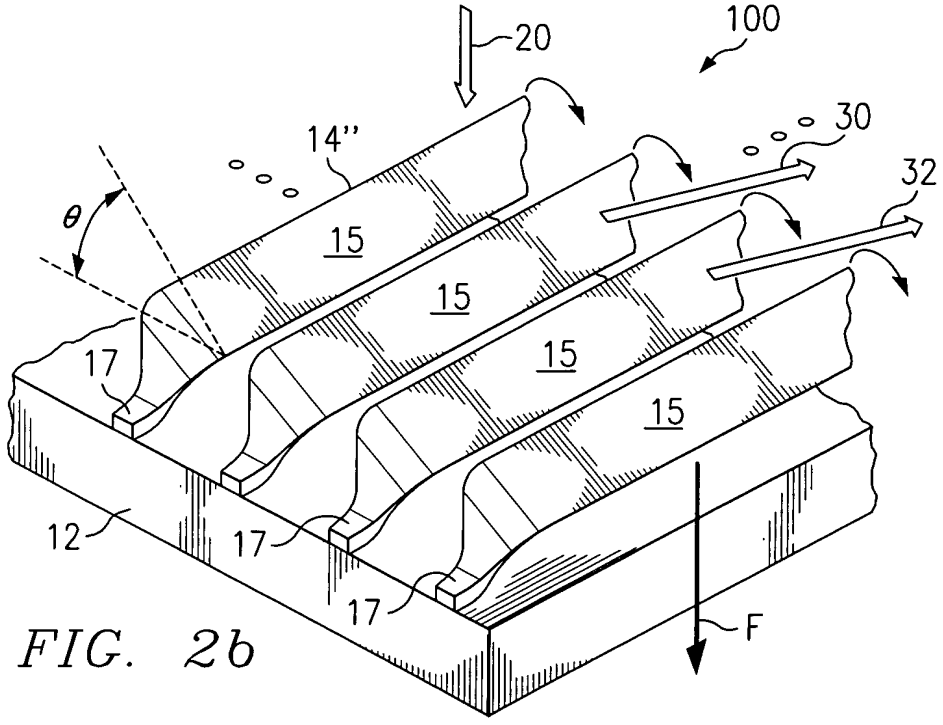
16
12

FIG. 2a


20
100
14''
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θ
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FIG. 2b

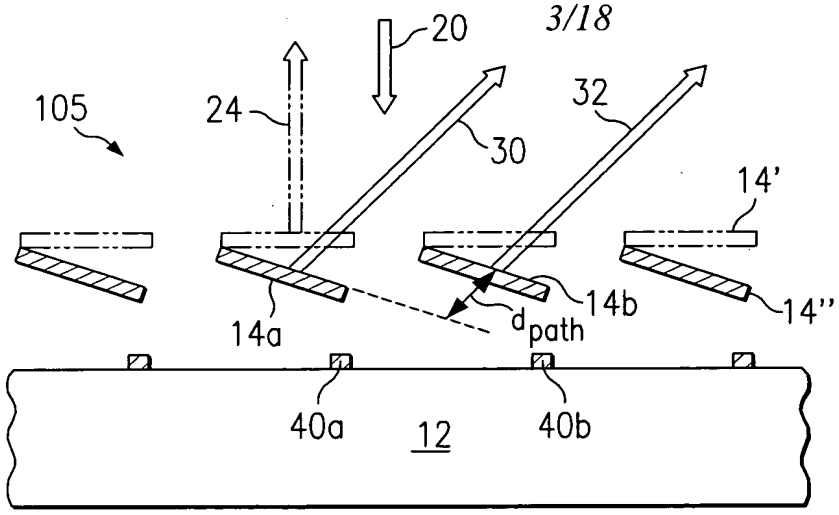


FIG. 3a

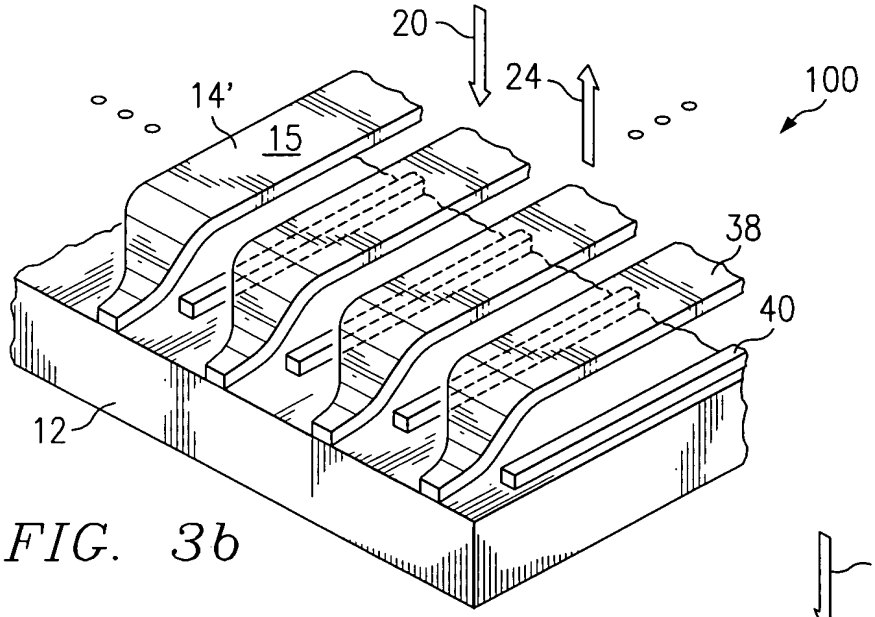


FIG. 3b

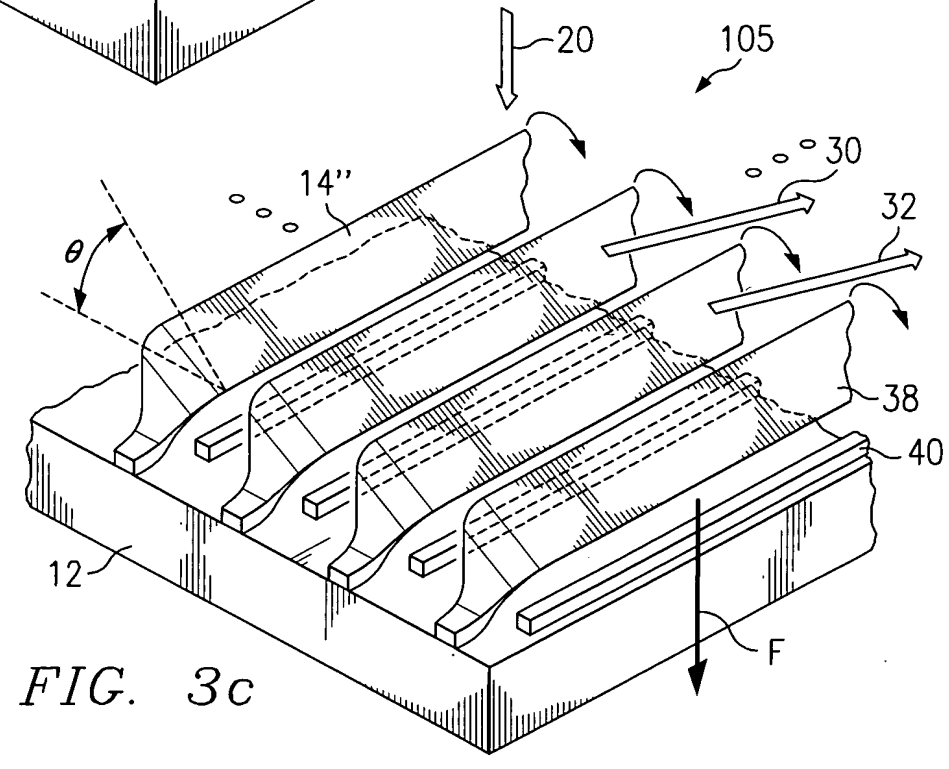


FIG. 3c

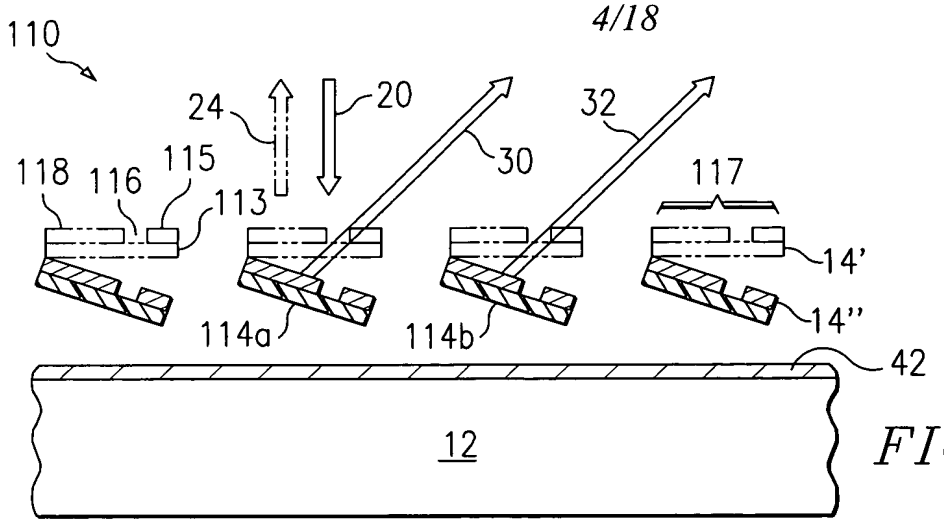


FIG. 4a

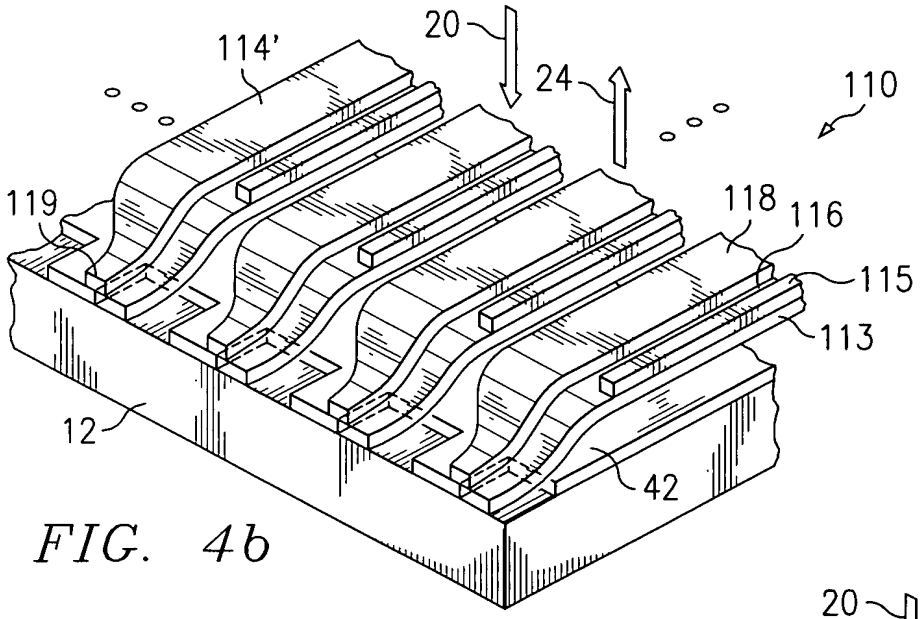


FIG. 4b

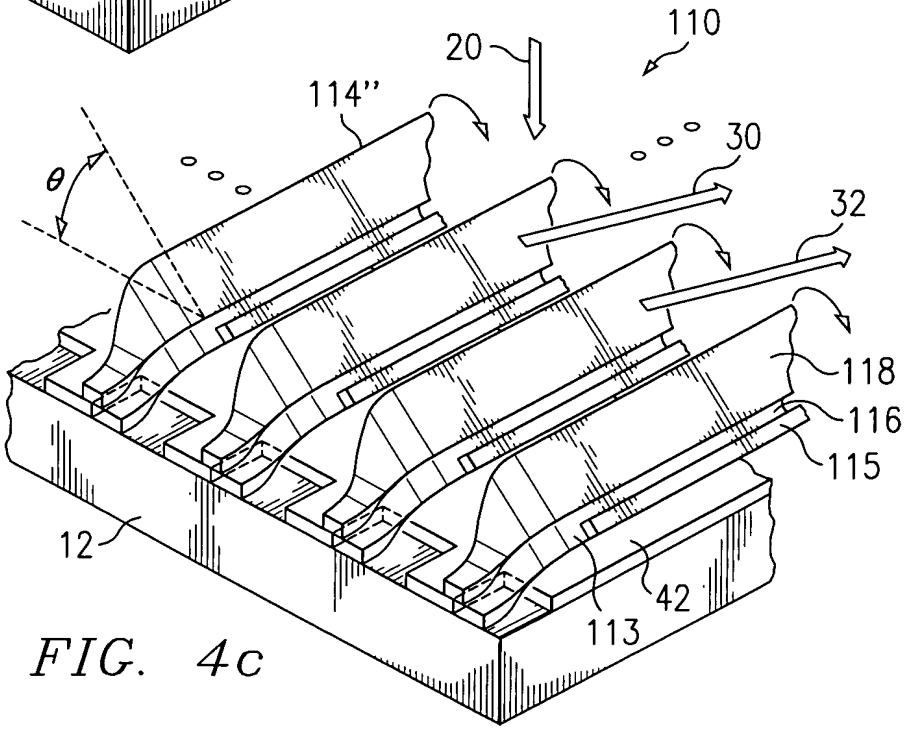


FIG. 4c

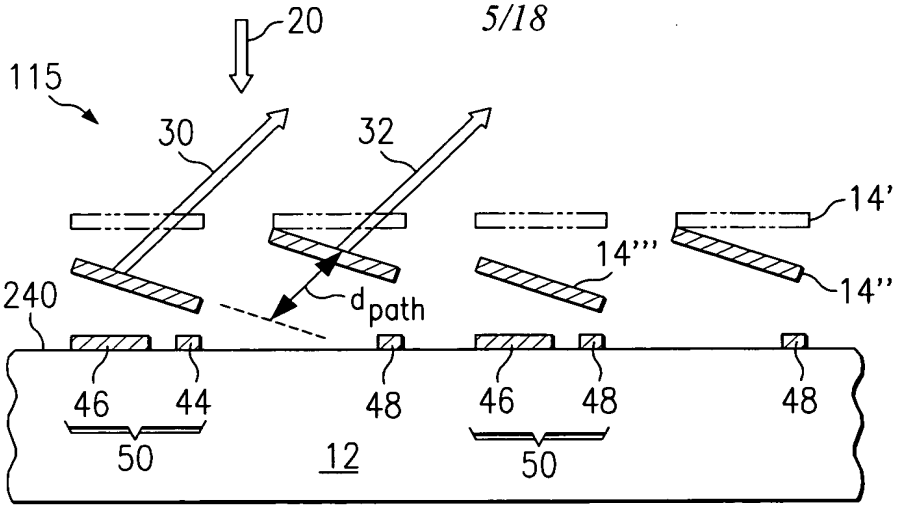


FIG. 5a

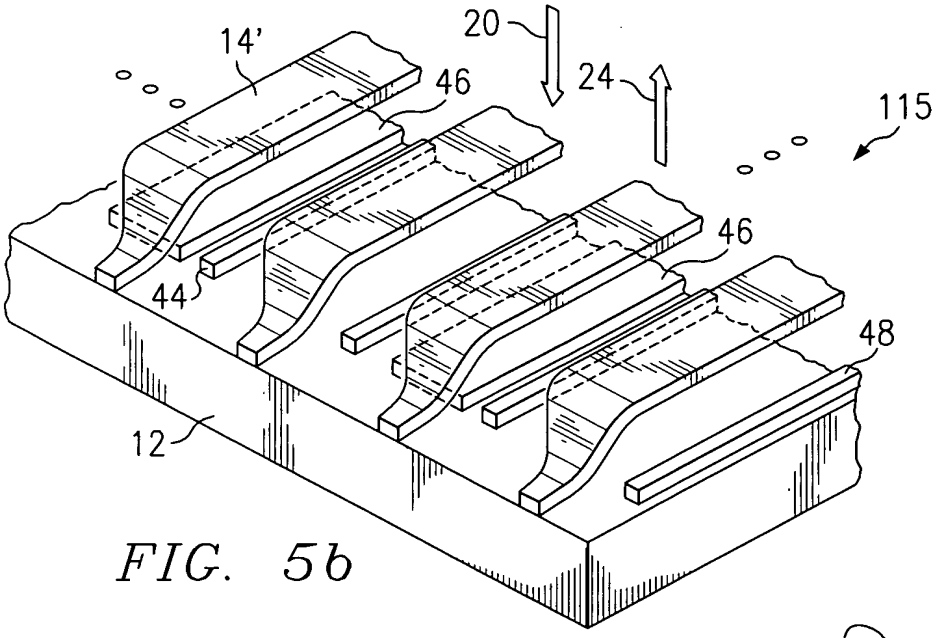


FIG. 5b

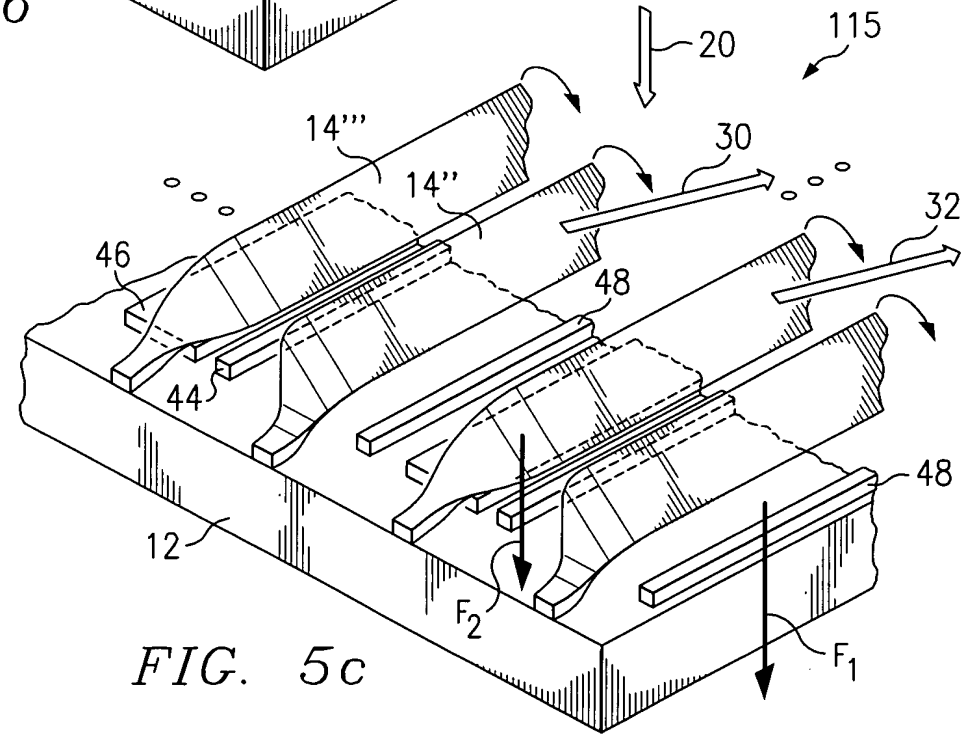


FIG. 5c

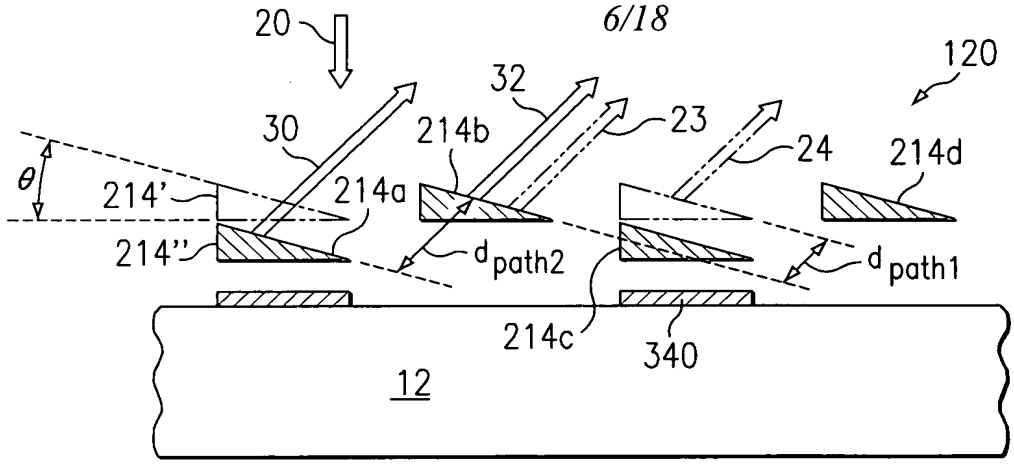


FIG. 6a

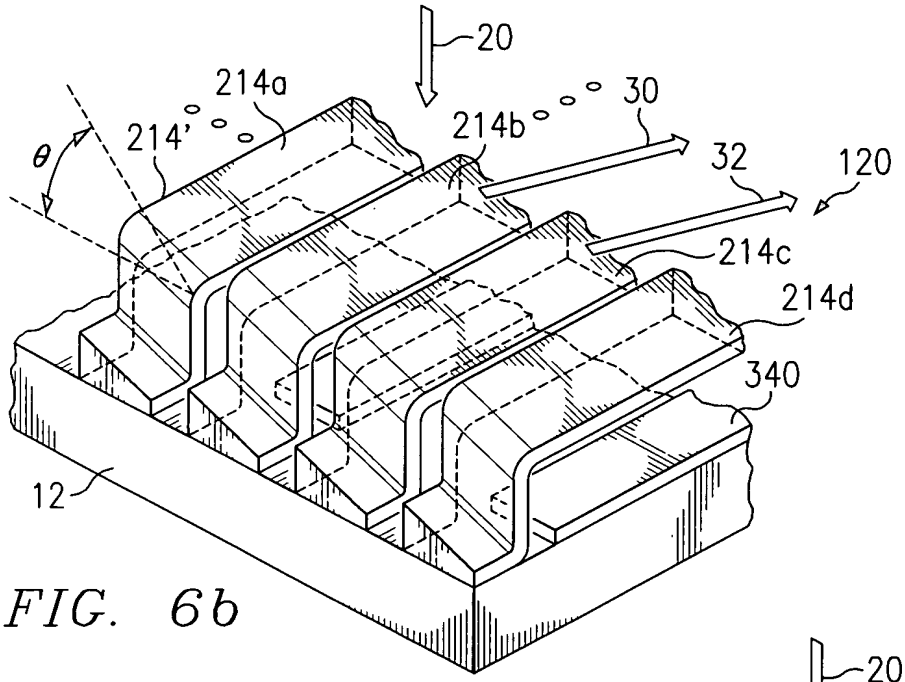


FIG. 6b

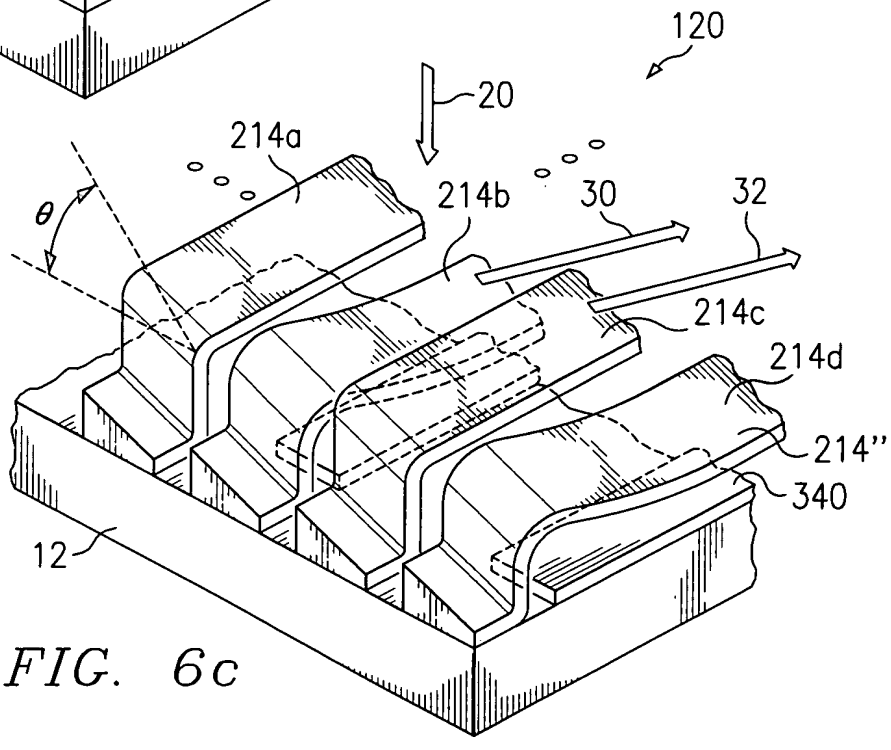


FIG. 6c

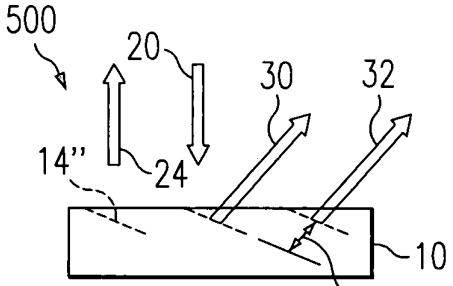


FIG. 7a

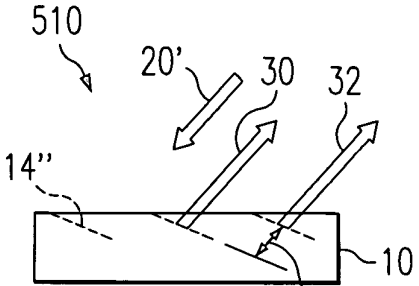


FIG. 7b

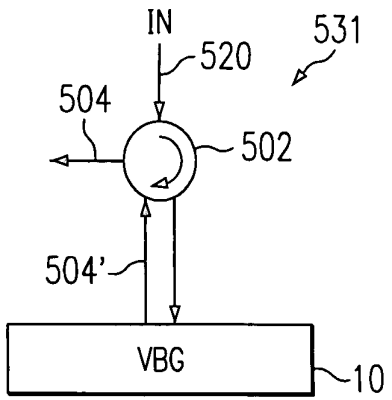


FIG. 8

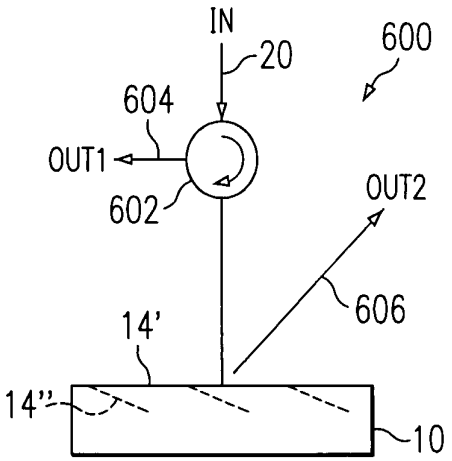


FIG. 9a

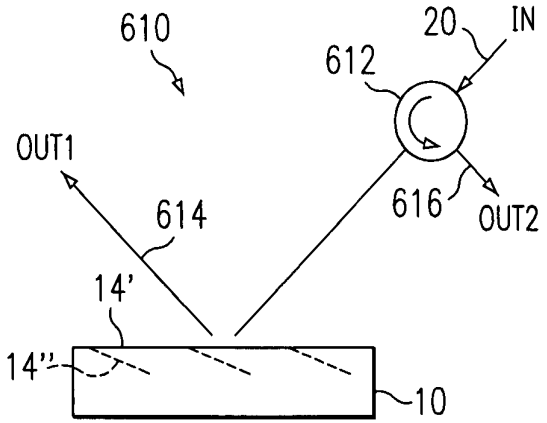


FIG. 9b

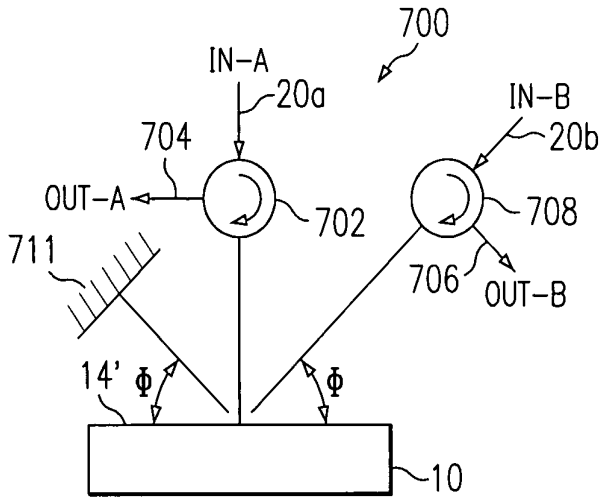


FIG. 10a

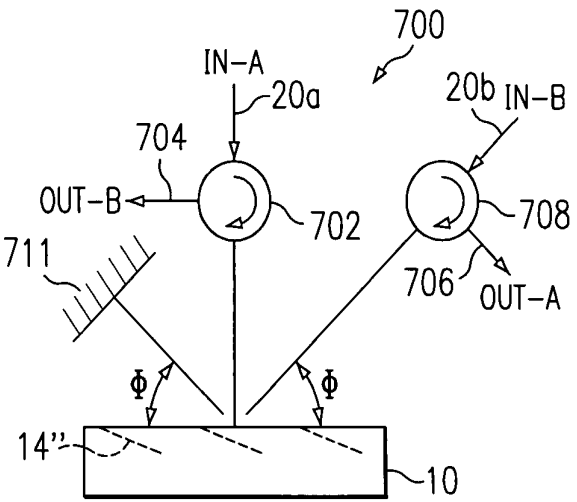


FIG. 10b

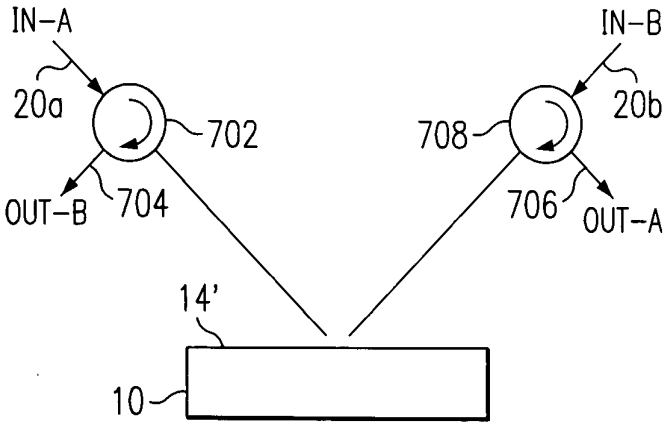


FIG. 10c

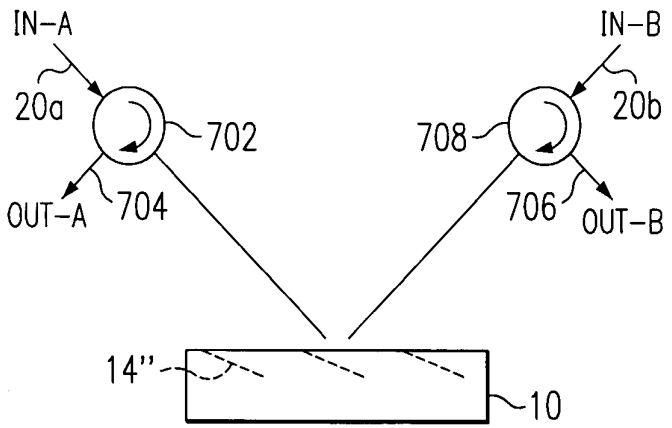


FIG. 10d

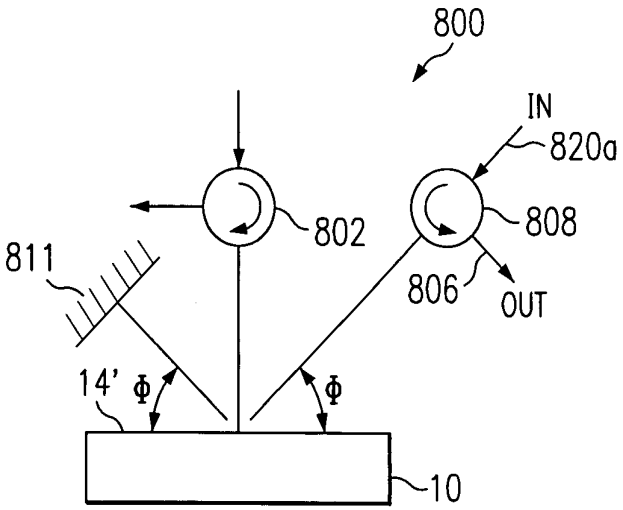


FIG. 11a

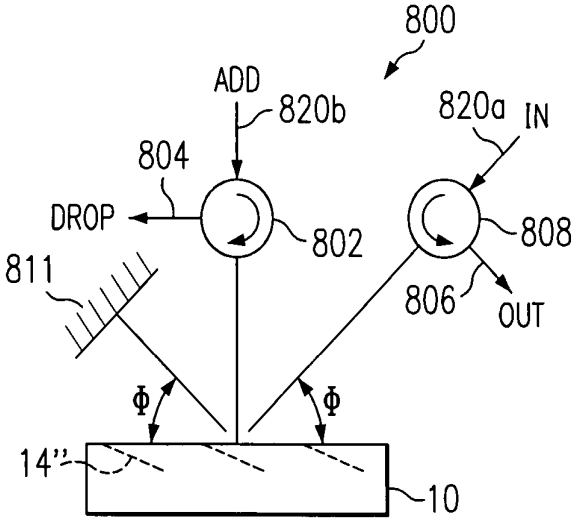


FIG. 11b

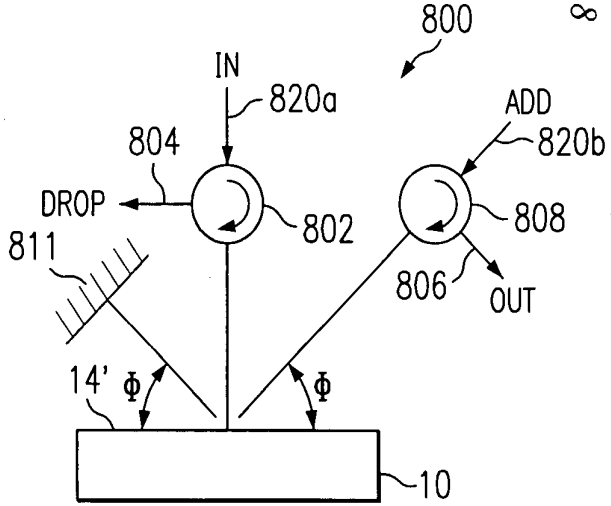


FIG. 11c

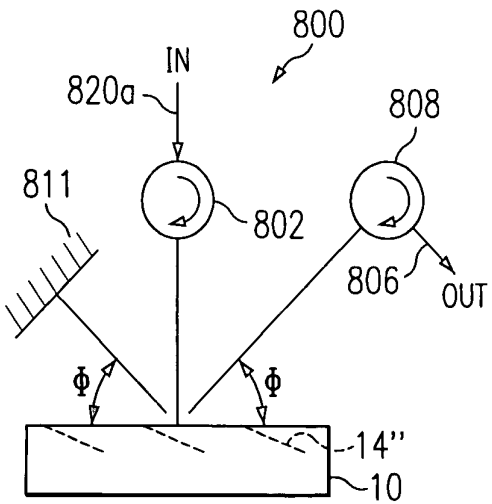


FIG. 11d

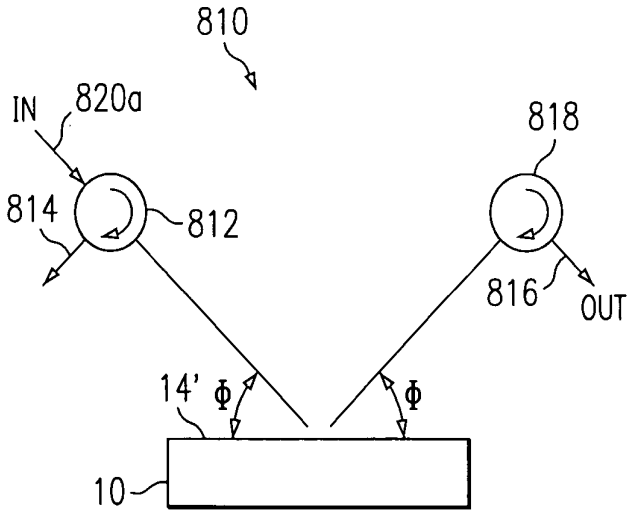


FIG. 11e

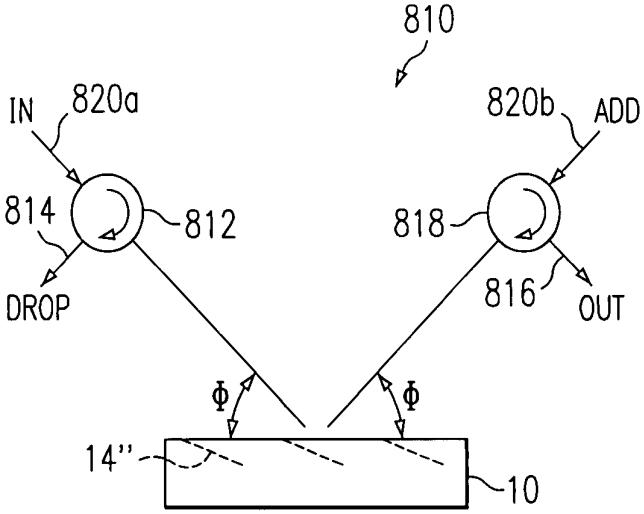


FIG. 11f

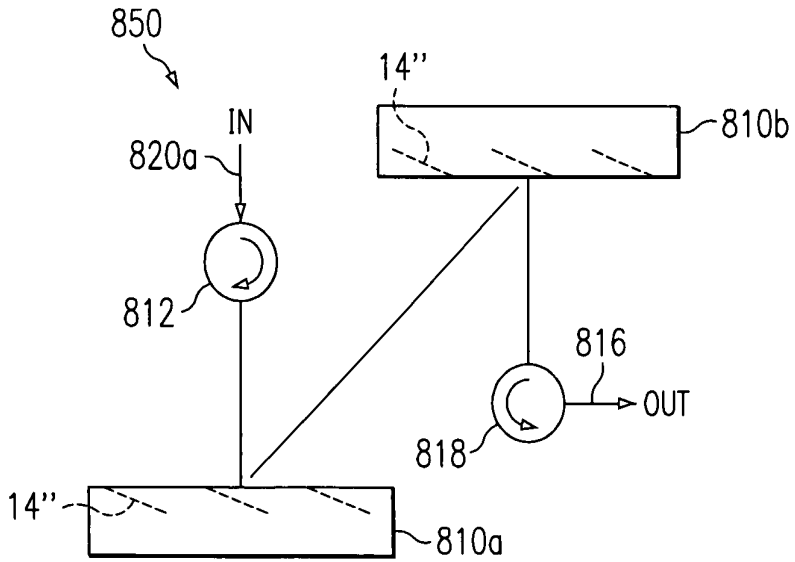


FIG. 11g

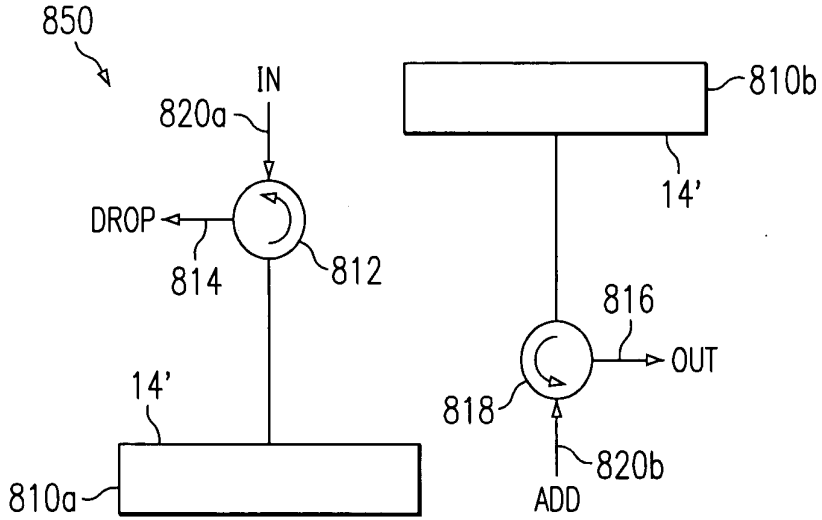


FIG. 11h

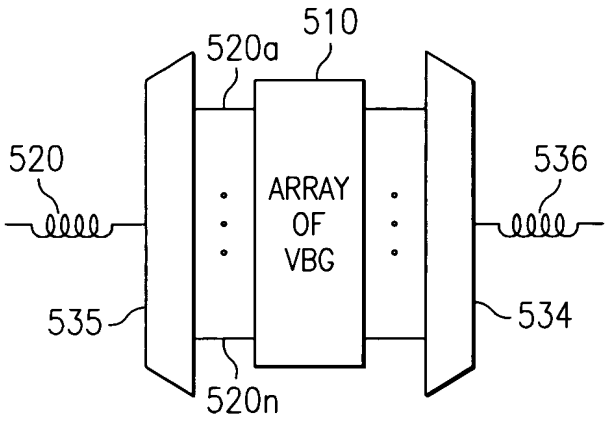


FIG. 12

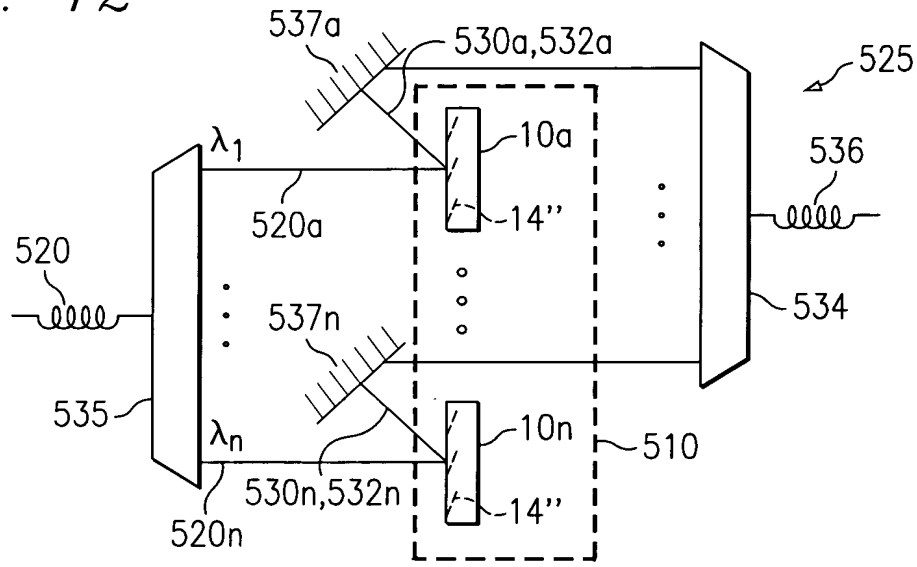


FIG. 13a

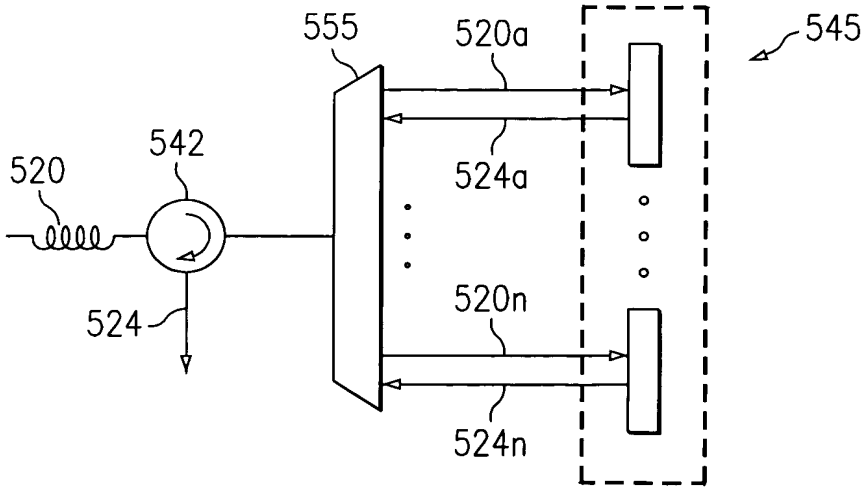


FIG. 13b

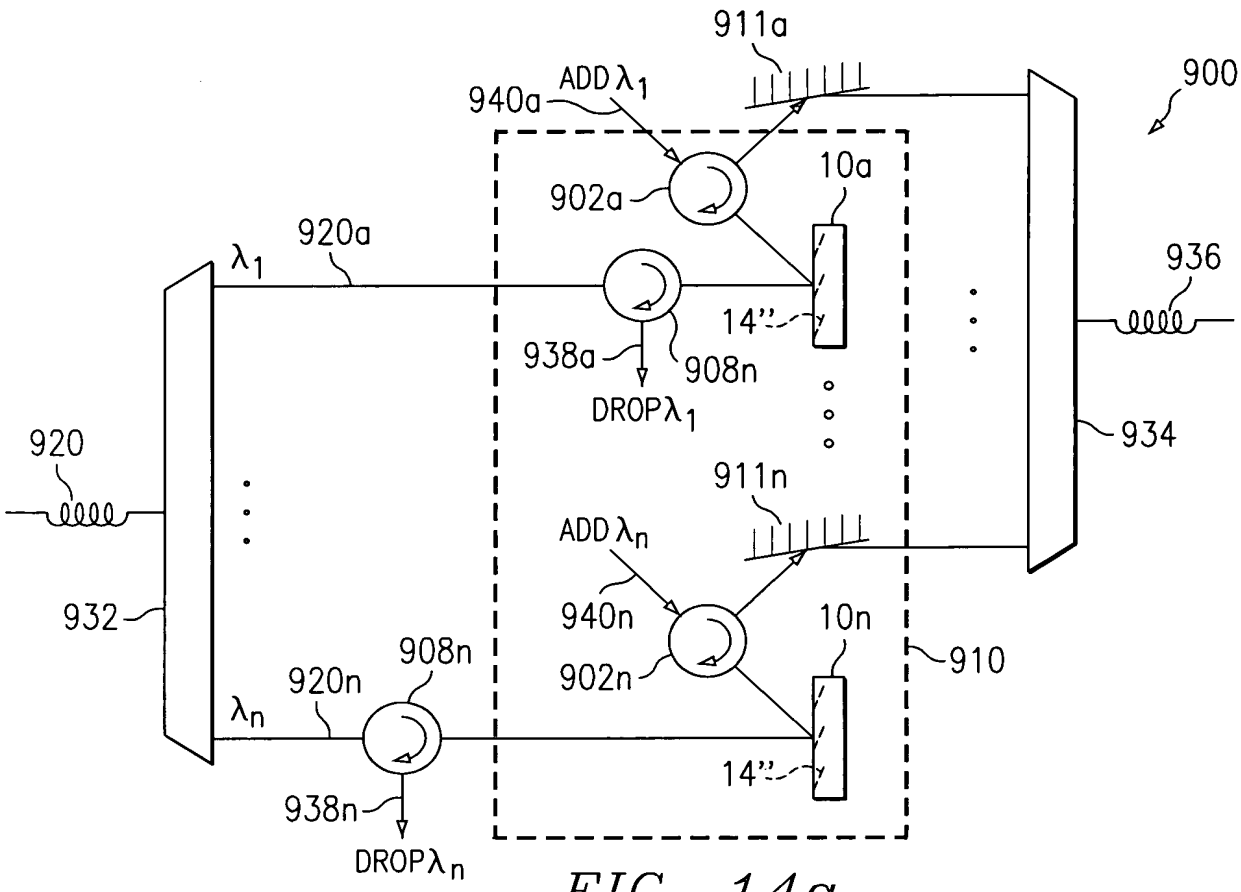


FIG. 14a

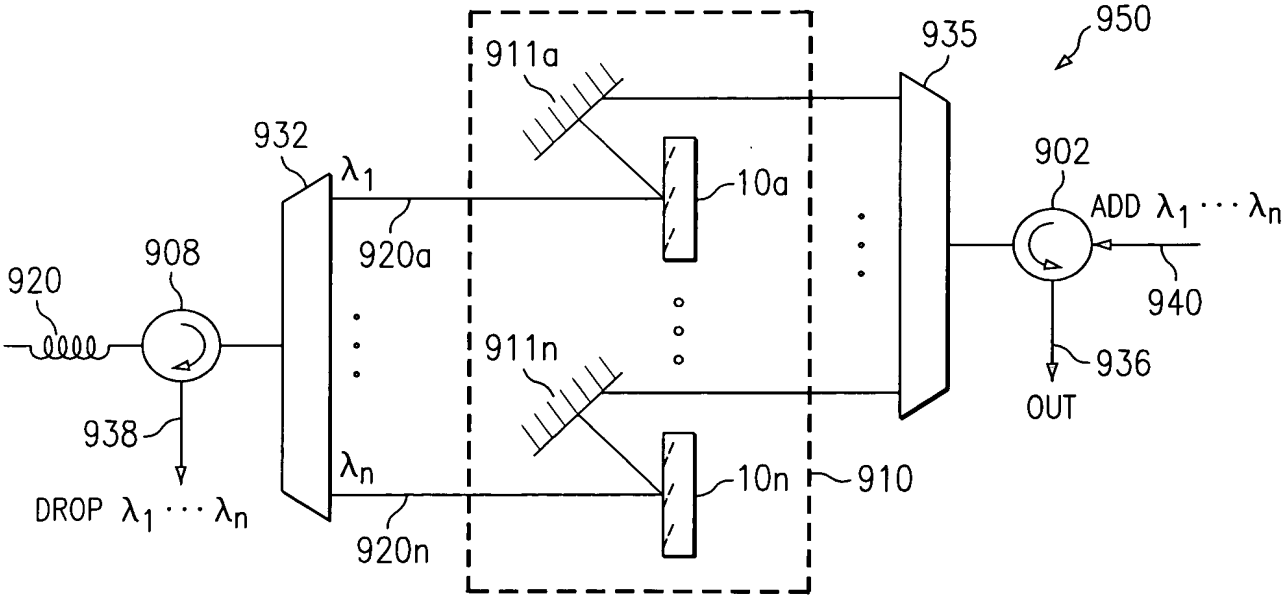
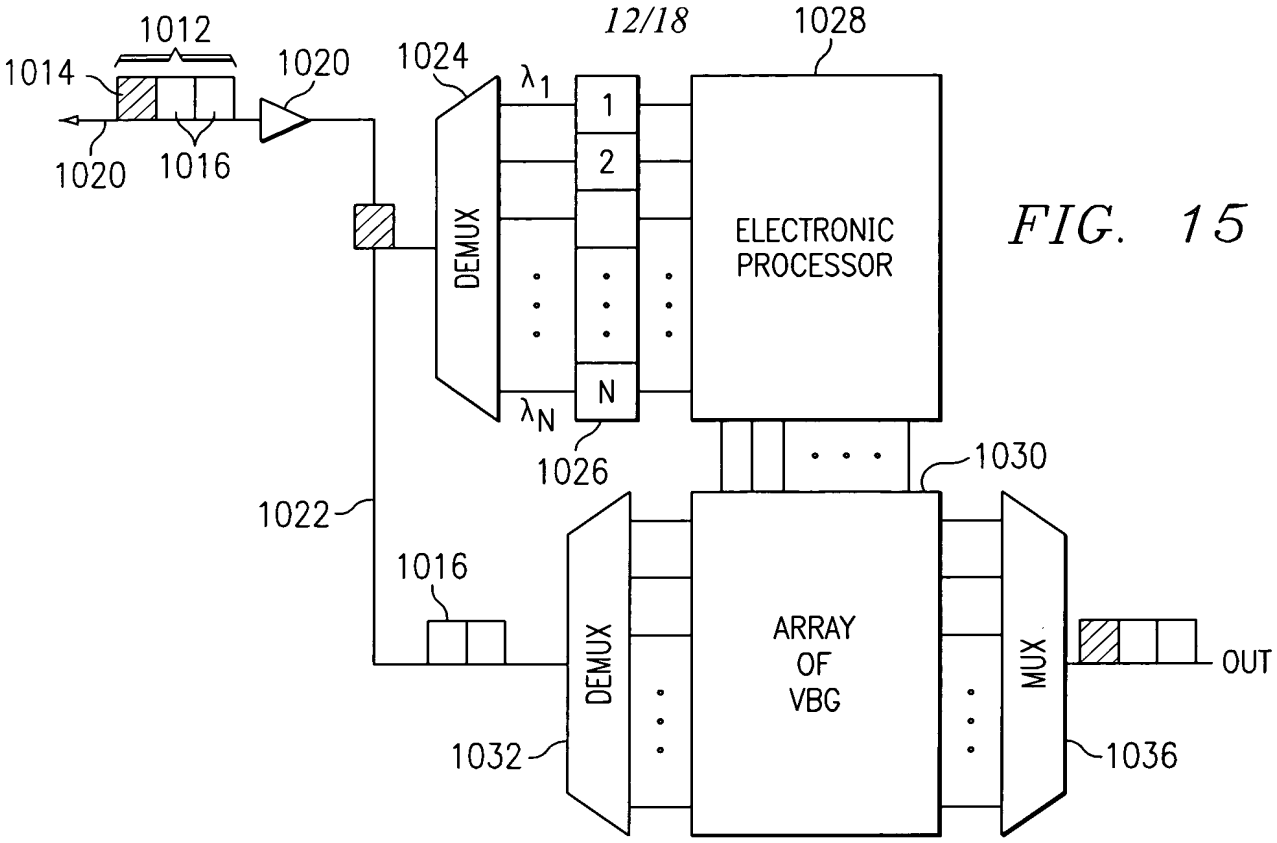


FIG. 14b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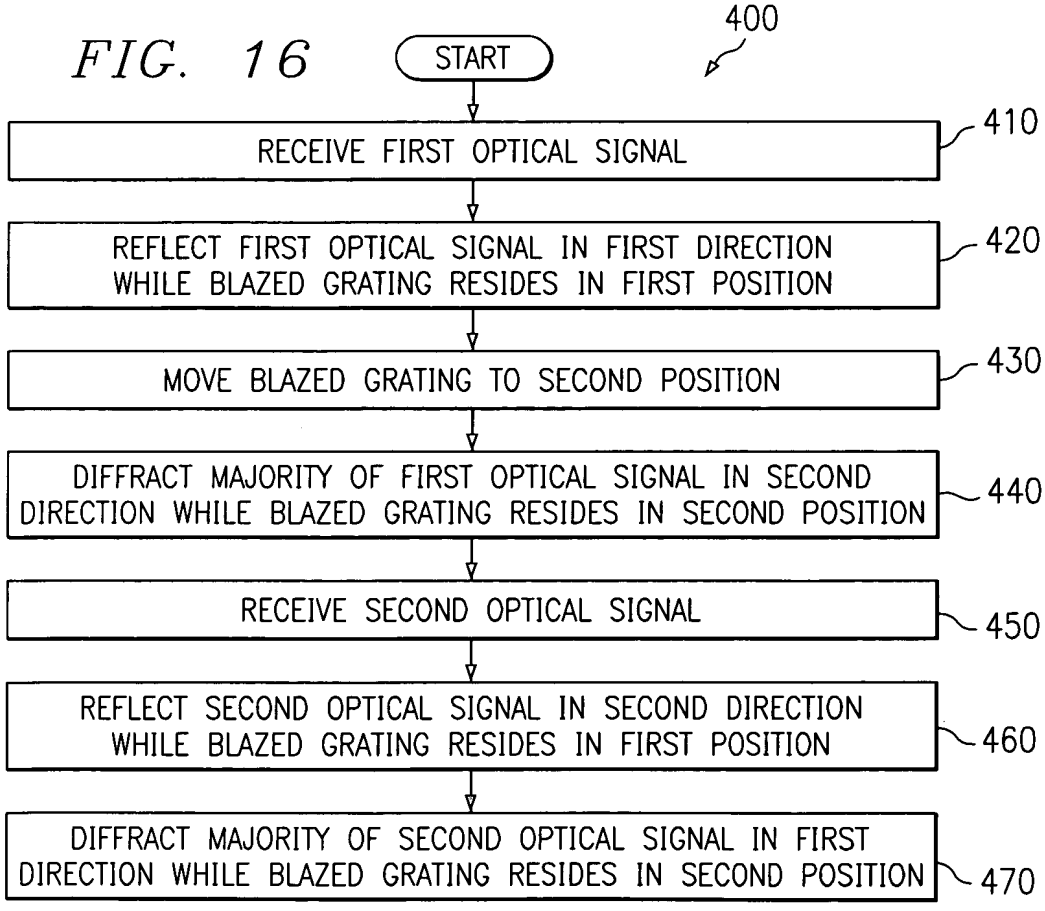
1014
1020
1020
1016
1024
λ_1
1
2
N
λ_N
DEMUX
ELECTRONIC PROCESSOR
1028
1026
1030
1022
1016
DEMUX
ARRAY OF VBG
MUX
OUT
1032
1036

FIG. 15

FIG. 16


400
START
RECEIVE FIRST OPTICAL SIGNAL
410
REFLECT FIRST OPTICAL SIGNAL IN FIRST DIRECTION WHILE BLAZED GRATING RESIDES IN FIRST POSITION
420
MOVE BLAZED GRATING TO SECOND POSITION
430
DIFFRACT MAJORITY OF FIRST OPTICAL SIGNAL IN SECOND DIRECTION WHILE BLAZED GRATING RESIDES IN SECOND POSITION
440
RECEIVE SECOND OPTICAL SIGNAL
450
REFLECT SECOND OPTICAL SIGNAL IN SECOND DIRECTION WHILE BLAZED GRATING RESIDES IN FIRST POSITION
460
DIFFRACT MAJORITY OF SECOND OPTICAL SIGNAL IN FIRST DIRECTION WHILE BLAZED GRATING RESIDES IN SECOND POSITION
470

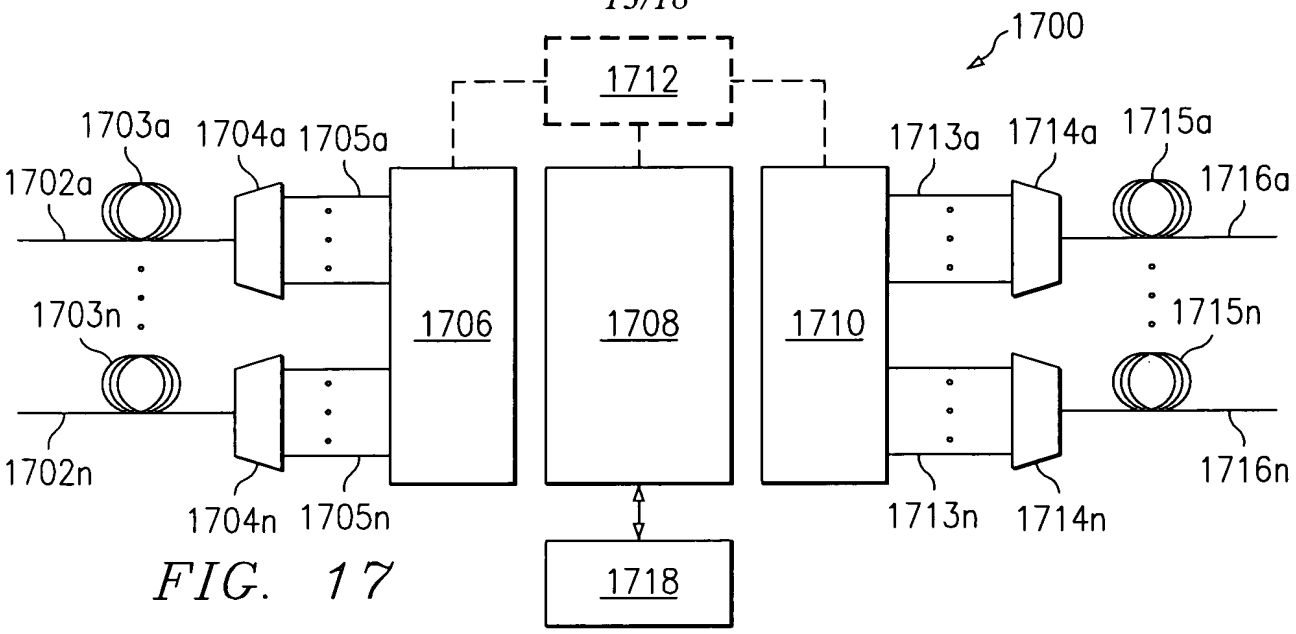


FIG. 17

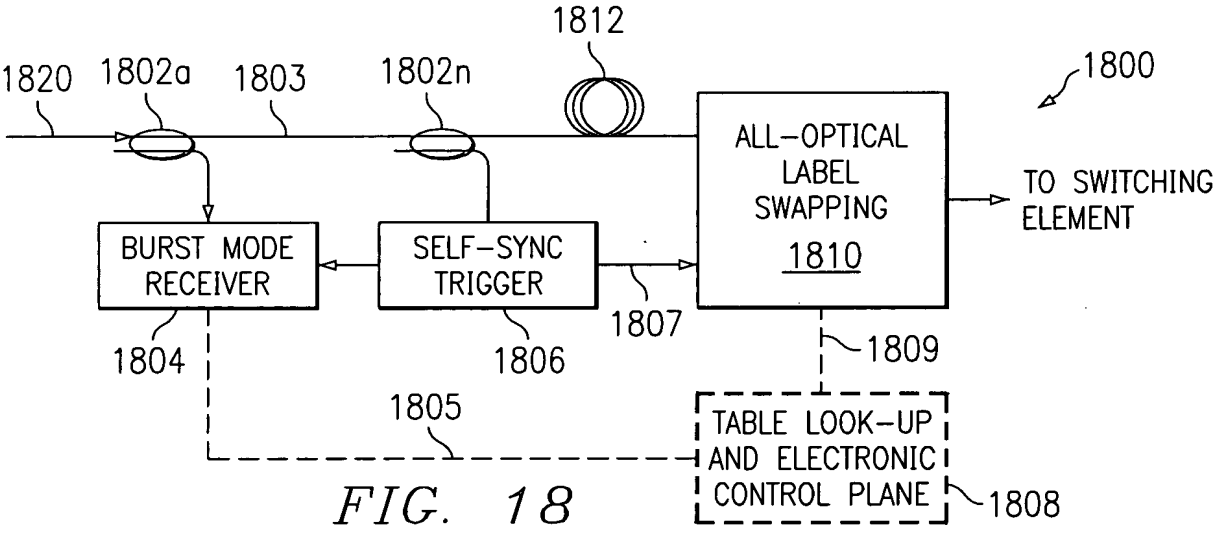


FIG. 18

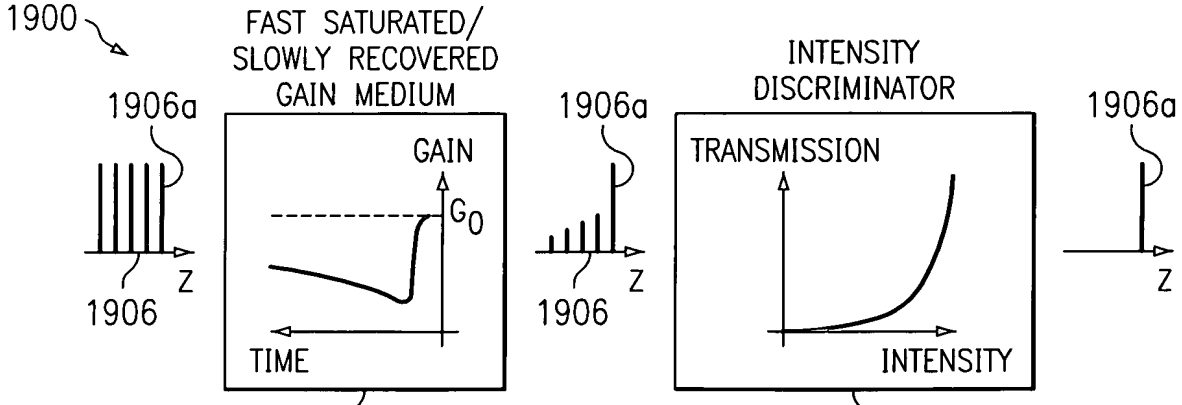


FIG. 19

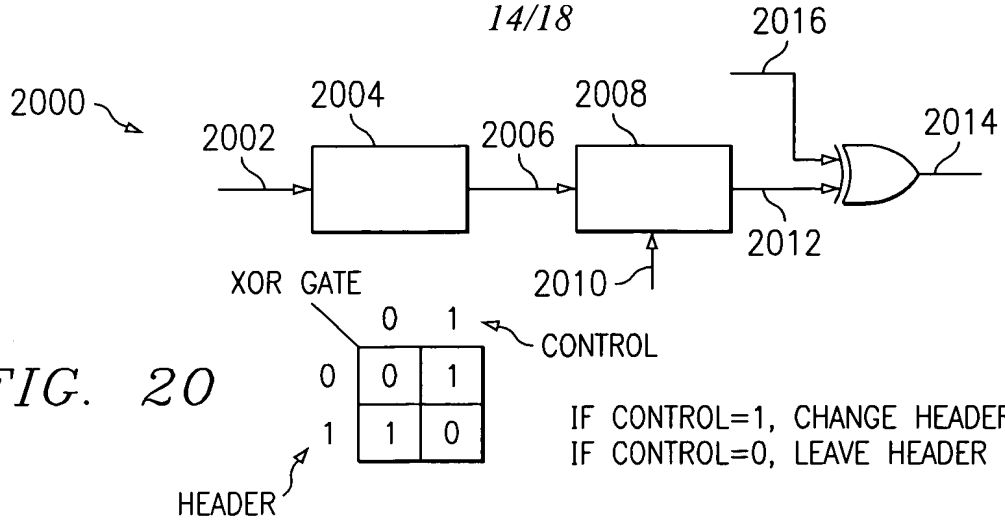


FIG. 20

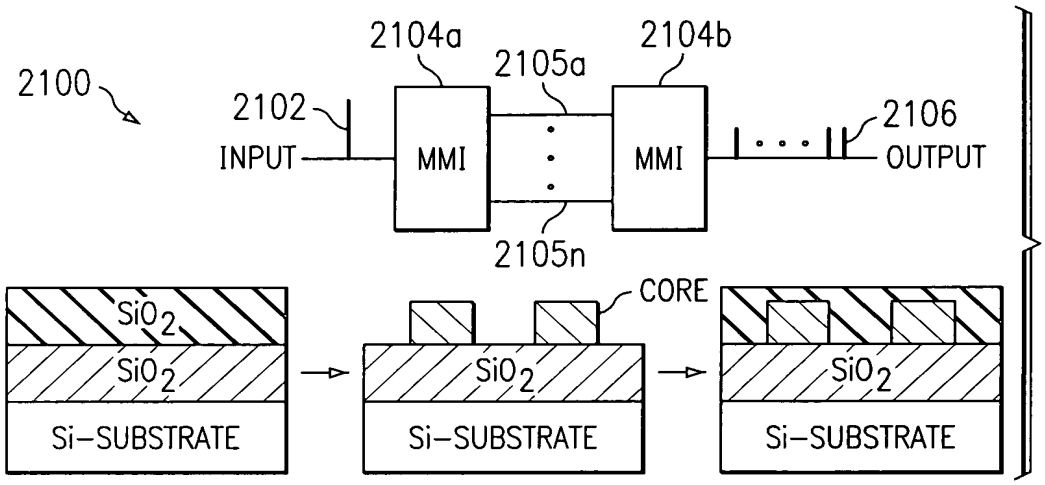


FIG. 21

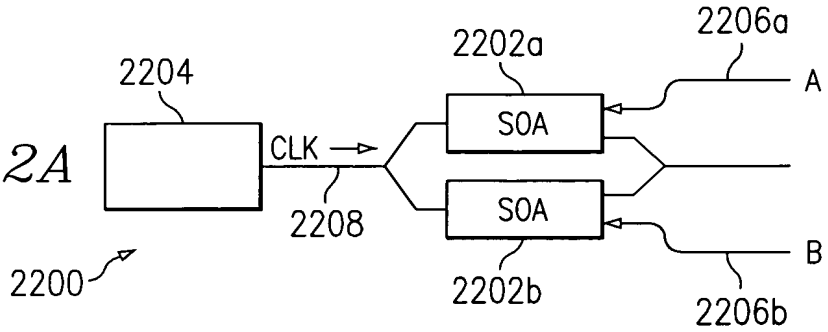


FIG. 22A

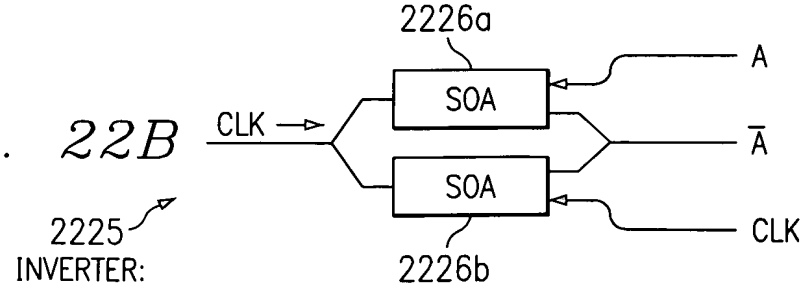


FIG. 22B

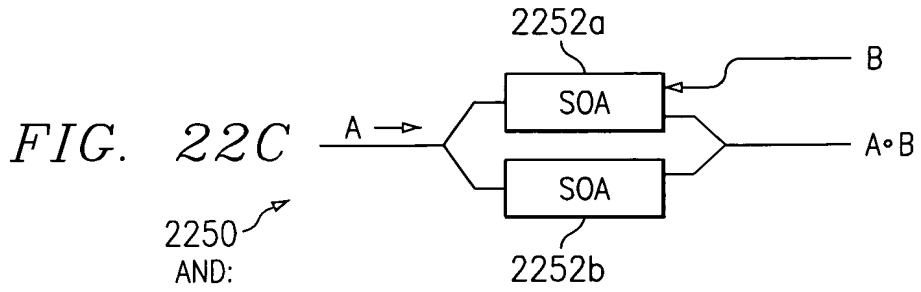


FIG. 22C

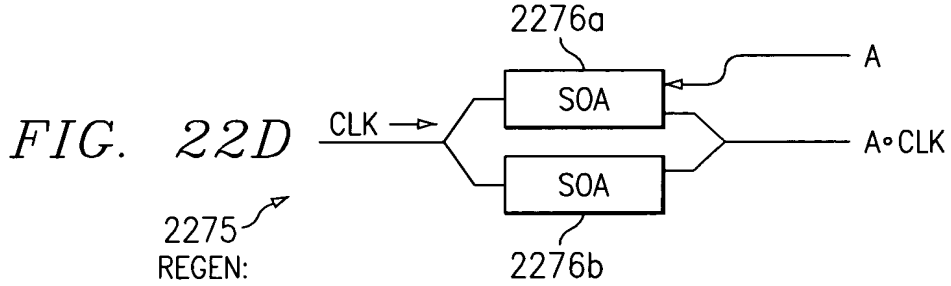


FIG. 22D

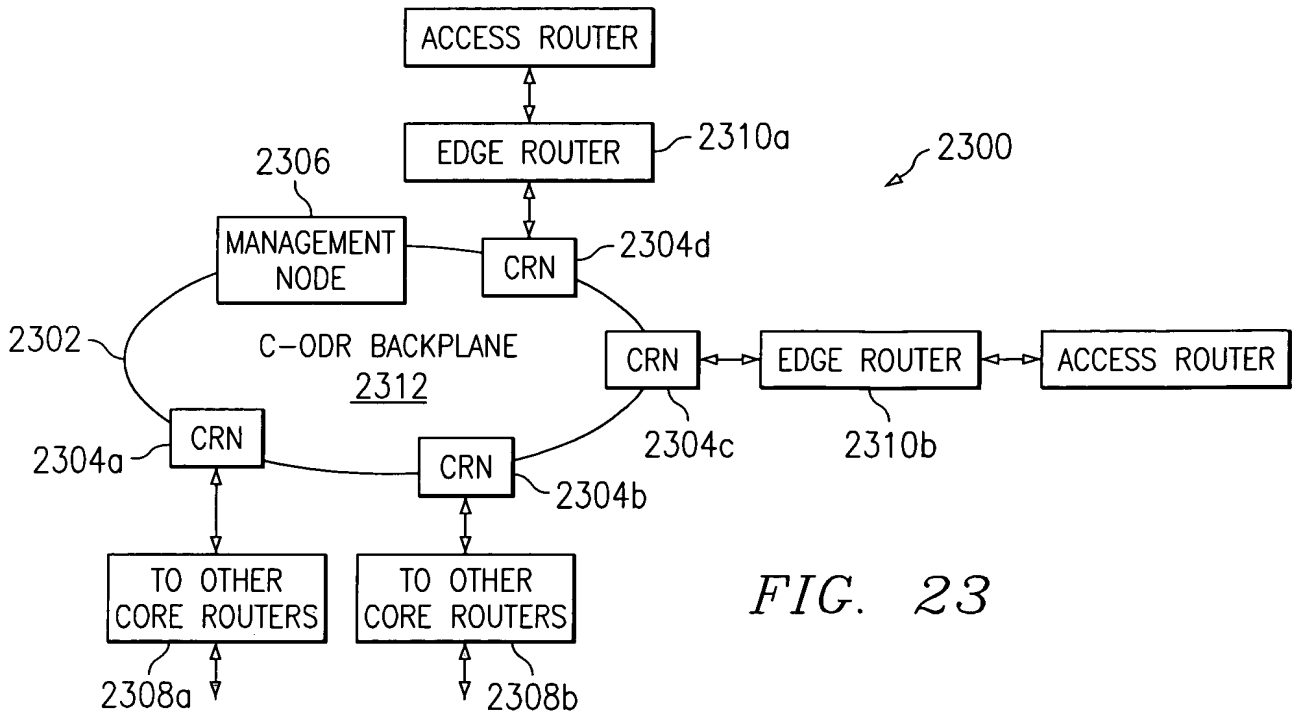


FIG. 23

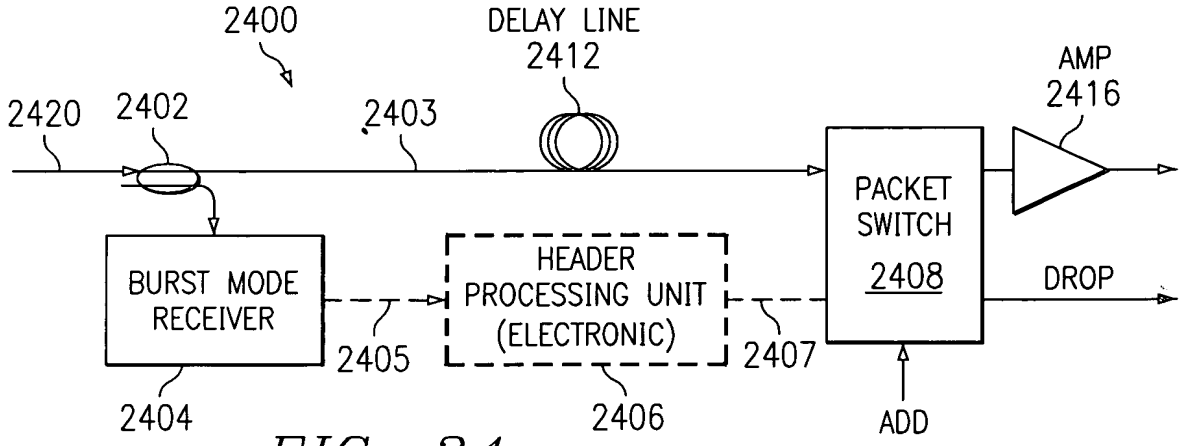


FIG. 24

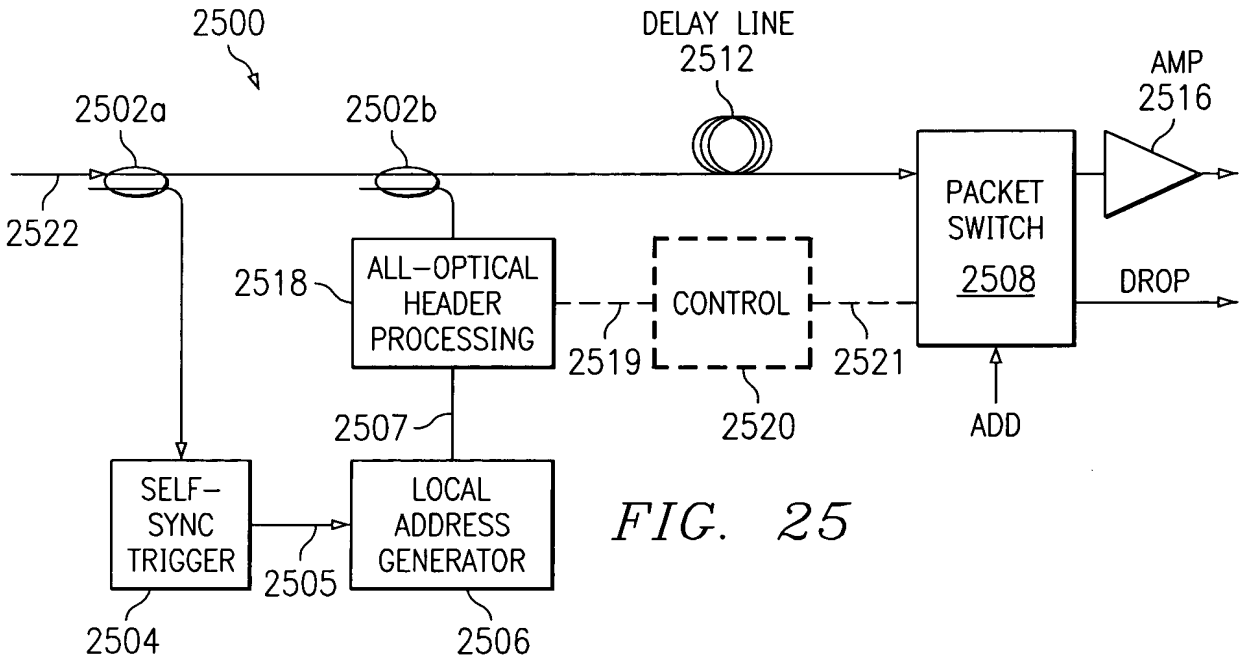


FIG. 25

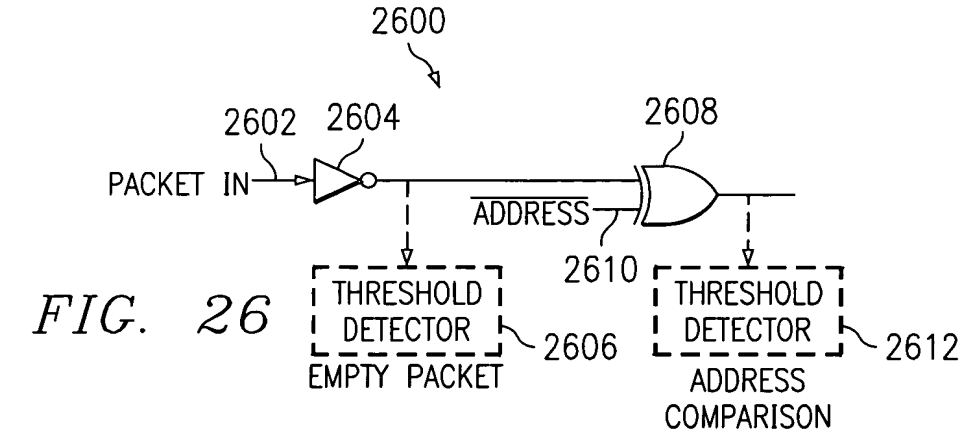


FIG. 26

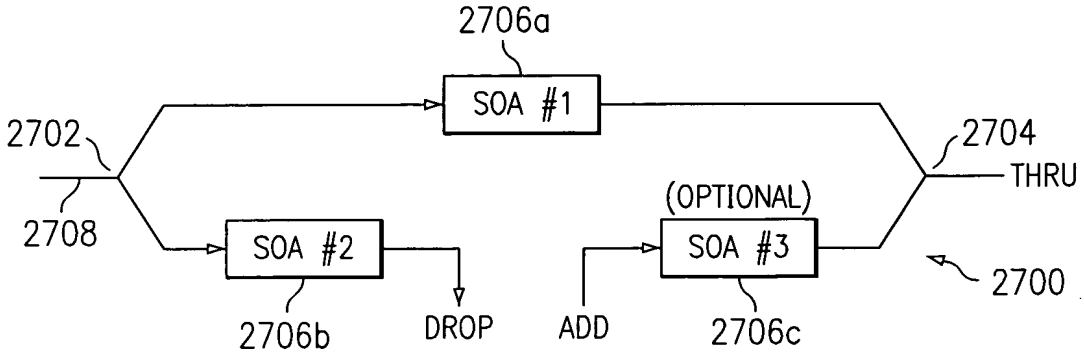


FIG. 27

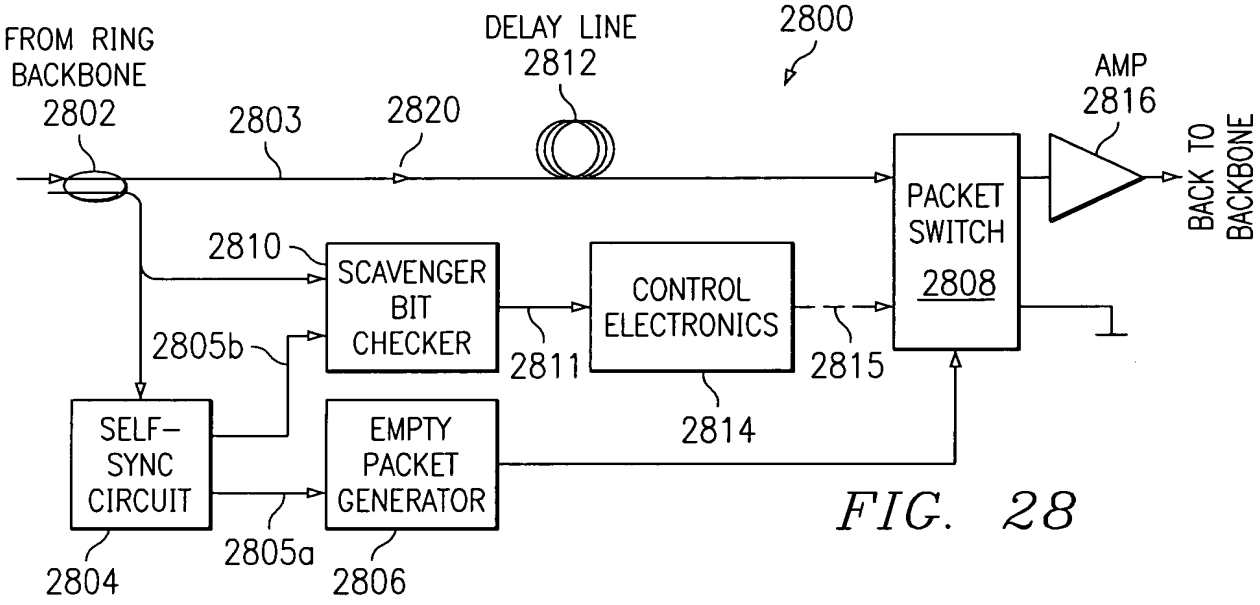


FIG. 28

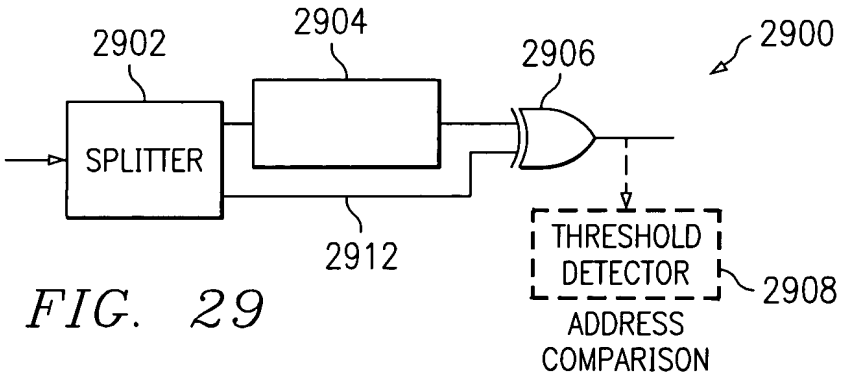


FIG. 29

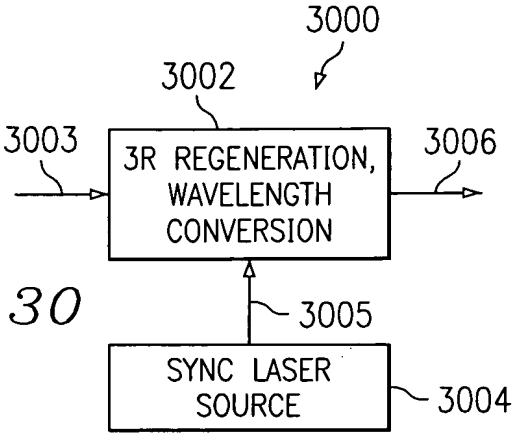

3000
3002
3003
3R REGENERATION, WAVELENGTH CONVERSION
3006
3005
SYNC LASER SOURCE
3004

FIG. 30

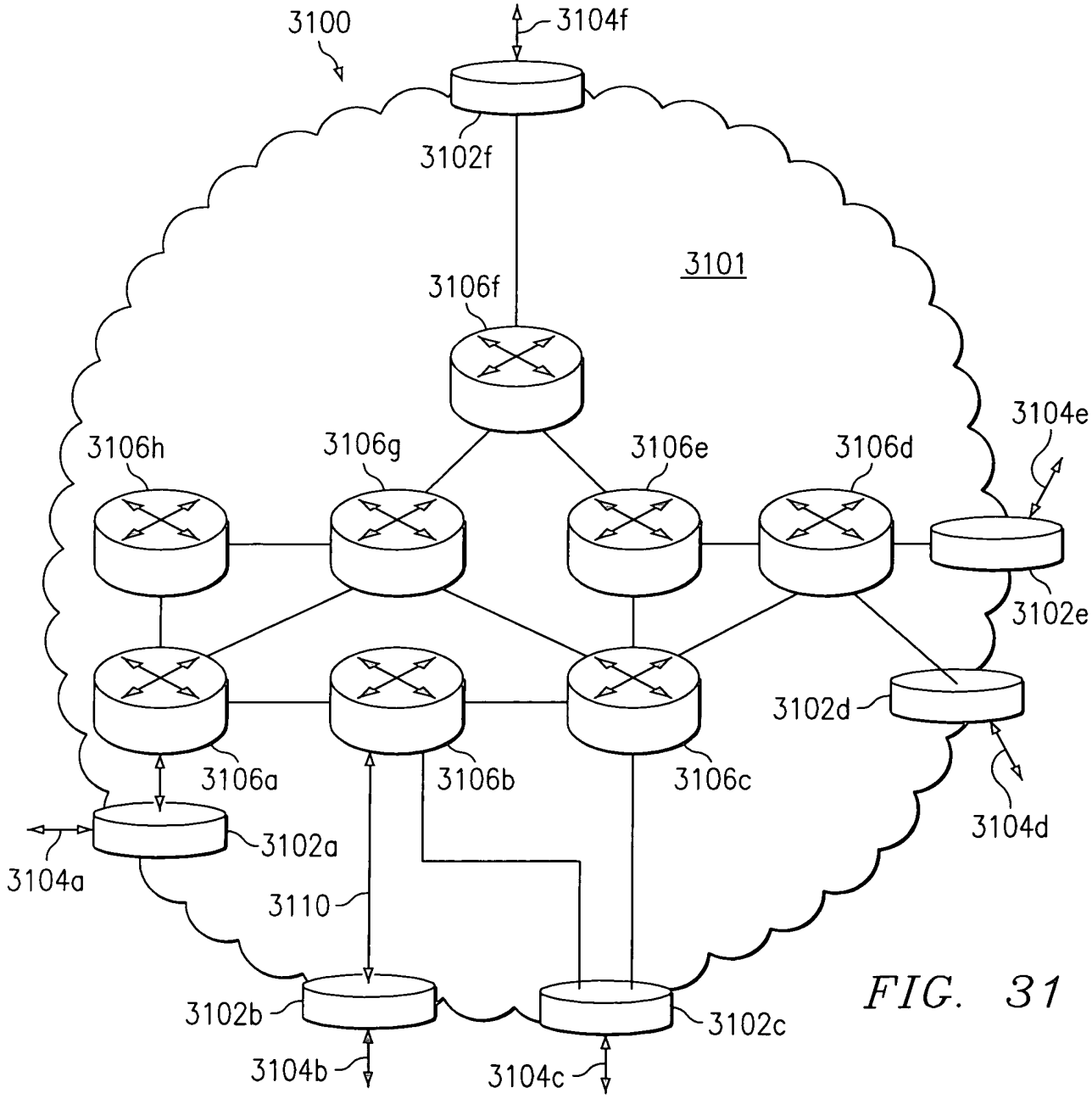

3100
3104f
3102f
3101
3106f
3104e
3106h
3106g
3106e
3106d
3102e
3102d
3106a
3106b
3106c
3104d
3102a
3104a
3110
3102b
3102c
3104b
3104c

FIG. 31